UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/007,766	11/08/2001	Brad R. Lewis	30014200-1002	3626

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EXAMINER
NAHAR, QAMRUN

ART UNIT	PAPER NUMBER
2191	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/007,766	LEWIS ET AL.
	Examiner	Art Unit	
	Qamrun Nahar	2191	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _13 February 2006_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-26_ is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-26_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☐ All   b) ☐ Some * c) ☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the RCE filed on 02/13/2006.

2.   The rejection under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S.

5,963,972) in view of Lomet (U.S. 5,870,763) to claims 1-4, 6-15 and 17-25 is moot in

view of new ground(s) of rejection.

3.   The rejection under 35 U.S.C. 103(a) as being unpatentable over Calder (U.S.

5,963,972) in view of Lomet (U.S. 5,870,763), and further in view of Cai (U.S.

6,349,363) to claims 5, 16 and 26 is moot in view of new ground(s) of rejection.

4.   Claims 1 and 12 have been amended.

5.   Claims 1-26 are pending.

Terminal Disclaimer

6.   An attorney or agent, not of record, is not authorized to sign a terminal disclaimer

in the capacity as an attorney or agent acting in a representative capacity as provided by

37 CFR 1.34 (a). See 37 CFR 1.321(b) and/or (c).

        Therefore, the double patenting rejection is maintained and reproduced below for

completeness.

Double Patenting

7.   The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d
1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed.
Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*,

422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8.   Claims 1-26 are provisionally rejected under the judicially created doctrine of

obviousness-type double patenting as being unpatentable over claims 1-56 of copending

Application No. 10/005,783 in view of Motoyama (U.S. 5,535,318). The following

example is given in which the actual claim language of Application '783 found in the

instant application is underlined, and where the substantial claim language found in the

instant application is italicized for clarity.

As per claim 1 of the instant application, '783 discloses (in claim 2):

A computer-implemented method in a data processing system having a computer

program for developing a data flow program comprising code segments that operate on

data in memory, the method comprising the steps of:

dividing *a memory area* into blocks *and associating each block with at least a*

portion of the data and with at least one code segment;

storing data read and data write identifiers for each code segment, the data read

and data write identifiers identifying at least a portion of the data read or written by the

code segment;

determining dependencies between blocks based on the read and write identifiers;

generating a graph representation of the data flow program, the graph

representation comprising nodes associated with the blocks, and dependencies between

the blocks that provide an execution order for code segments.

'783 further discloses executing a debugging command on the data flow program.

Motoyama teaches executing a debugging command on the data flow program (see

Figure19, column 14, lines 63-64). Therefore, it would have been obvious to one having

ordinary skill in the computer art at the time of the invention was made to modify the

method disclosed by Application '783 to include executing a debugging command on the

data flow program using the teaching of Motoyama. The modification would be obvious

because one of ordinary skill in the art would be motivated to monitor program execution

flow.

This is a provisional obviousness-type double patenting rejection.

Response to Amendment

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

10.   Claims 1-4, 6-15 and 17-25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763), and

further in view of Razdow (U.S. 6,330,008).

Per Claim 1 (Amended):

Calder teaches dividing the memory into blocks (column 4, lines 29-40);

assigning at least a portion of the data and at least one code segment to each block

(column 3, lines 56-62; Table 1 in column 4, lines 8-17; and see Figure 4 for the mapping

of the data and code segment to the cache memory); determining whether dependencies

exist among the blocks such that a first block depends on data assigned to a second block;

and generating a graph representing the blocks and the determined dependencies (column

3, lines 56-66; column 7, lines 6-56; column 8, lines 10-54; and column 12, lines 25-37).

Calder does not explicitly teach storing data read and data write identifiers for each code

segment, the data read and data write identifiers identifying at least a portion of the data

read or written by the code segment or determining whether dependencies exist among

the blocks such that a first block depends on data assigned to a second block using the

read and write identifiers or facilitating development of the data flow program by

generating a graph representing the blocks and the determined dependencies and

displaying the graph to a user.

Lomet teaches storing data read and data write identifiers for each code segment,

the data read and data write identifiers identifying at least a portion of the data read or

written by the code segment ("state identifier field" in column 18, lines 30-31 and lines

55-59); and determining whether dependencies exist among the blocks such that a first

block depends on data assigned to a second block using the read and write identifiers

(column 19, lines 1-35).

Razdow teaches facilitating development of the data flow program by generating

a graph representing the blocks and the determined dependencies and displaying the

graph to a user (column 2, lines 38-44 and see Figures 3 and 5).

It would have been obvious to one having ordinary skill in the computer art at the

time of the invention was made to modify the method disclosed by Calder to include

storing data read and data write identifiers for each code segment, the data read and data

write identifiers identifying at least a portion of the data read or written by the code

segment; determining whether dependencies exist among the blocks such that a first

block depends on data assigned to a second block using the read and write identifiers; and

facilitating development of the data flow program by generating a graph representing the

blocks and the determined dependencies and displaying the graph to a user using the

teaching of Lomet and Razdow. The modification would be obvious because one of

ordinary skill in the art would be motivated to minimize cache misses by ensuring the

proper order of computer operations (Calder, column 1, lines 17-39).

Per Claim 2:

The rejection of claim 1 is incorporated, and Calder further teaches wherein the

step of displaying comprises the step of displaying a graph comprising nodes assigned to

the blocks and dependency arcs representing the determined dependencies (column 3,

lines 56-66; column 7, lines 6-56; column 8, lines 10-54; and column 12, lines 25-37; A

block is a group of instructions in a program that are treated as a unit. Therefore, the unit

is stored in one block of memory.).

Per Claim 3:

The rejection of claim 2 is incorporated, and Razdow further teaches wherein the step of displaying further comprises the step of presenting the dependency arcs using a satisfied dependency visualization when the determined dependency is satisfied, and presenting the dependency arcs using an unsatisfied dependency visualization when the determined dependency is unsatisfied (column 3, lines 5-25 and column 4, lines 4-20).

Per Claim 4:

The rejection of claim 2 is incorporated, and Razdow further teaches further comprising the steps of: receiving a node selection specifying a selected one of the nodes; determining unmet dependencies for the selected node; and displaying in a visually distinctive manner the unmet dependencies in the graph (column 3, lines 5-25 and column 4, lines 4-20).

Per Claim 6:

The rejection of claim 2 is incorporated, and Razdow further teaches wherein nodes are assigned to the blocks include executed nodes and unexecuted nodes, and wherein the step of displaying further comprises the step of displaying the unexecuted nodes using an unexecuted visualization and the executed nodes using an executed visualization (column 3, lines 5-25 and column 4, lines 4-20).

Per Claim 7:

The rejection of claim 1 is incorporated, and Razdow further teaches wherein the data includes a data structure, and wherein the step of displaying further comprises the step of: facilitating visualization of at least a portion of the data structure accessed by at least one of the code segments by graphically presenting at least a portion of the data structure and accentuating the portion of the data structure accessed by the at least one code segment (column 3, lines 5-25 and column 4, lines 4-20).

Per Claim 8:

This is another version of the claimed method discussed above, claim 1, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 9:

The rejection of claim 8 is incorporated, and Calder further teaches wherein the nodes include executed nodes and unexecuted nodes, and wherein the step of displaying comprises the step of displaying the unexecuted nodes with an unexecuted visualization and displaying the executed nodes with an executed visualization (column 5, lines 36-49).

Per Claim 10:

The rejection of claim 9 is incorporated, and Calder further teaches wherein the nodes include executing nodes, and wherein the step of displaying comprises the step of displaying the executing nodes with an executing visualization (column 5, lines 36-49).

Per Claim 11:

The rejection of claim 8 is incorporated, and Calder further teaches wherein the

node dependencies include satisfied dependencies and unsatisfied dependencies, and

wherein the step of displaying comprises the steps of displaying the unsatisfied

dependencies using an unsatisfied dependency visualization, and displaying the satisfied

dependencies using a satisfied dependency visualization (column 5, lines 36-41).

Per Claims 12 (Amended), 13-15 & 17-18:

These are computer-readable medium versions of the claimed method discussed

above (claims 1-4 and 6-7, respectively), wherein all claim limitations also have been

addressed and/or covered in cited areas as set forth above. Thus, accordingly, these

claims are also obvious.

Per Claim 19:

This is another version of the claimed method discussed above (claims 1 and 6),

wherein all claim limitations also have been addressed and/or covered in cited areas as set

forth above, including "while the code segments are executing, determining which nodes

in the graph are unexecuted nodes and which nodes in the graph are executed nodes; and

displaying the unexecuted nodes in a manner visually distinctive from the executed

nodes" (Razdow, column 4, lines 4-20). Thus, accordingly, this claim is also obvious.

Per Claim 20:

This is a data processing system version of the claimed method discussed above

(claims 1 and 2), wherein all claim limitations also have been addressed and/or covered

in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claims 21-22:

These are data processing system versions of the claimed method discussed above

(claims 6 and 3, respectively), wherein all claim limitations also have been addressed

and/or covered in cited areas as set forth above. Thus, accordingly, these claims are also

obvious.

Per Claim 23:

This is a data processing system version of the claimed method discussed above

(claims 1 and 2), wherein all claim limitations also have been addressed and/or covered

in cited areas as set forth above, including "means for apportioning a memory into

regions and associating the data and the code segments with the regions" (Calder, column

3, lines 56-62; Table 1 in column 4, lines 8-17; and see Figure 4 for the mapping of the

data and code segment to the cache memory). Thus, accordingly, this claim is also

obvious.

Per Claim 24:

This is a computer readable memory device version of the claimed method

discussed above, claim 1, wherein all claim limitations also have been addressed and/or

covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 25:

The rejection of claim 24 is incorporated, and Calder further teaches wherein the

data structure further comprises: a processed flag that indicates whether at least one of the

nodes is executed or unexecuted (column 5, lines 36-49).

11. Claims 5, 16 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Calder (U.S. 5,963,972) in view of Lomet (U.S. 5,870,763), and in view of Razdow

(U.S. 6,330,008), and further in view of Cai (U.S. 6,349,363).

Per Claim 5:

The rejection of claim 2 is incorporated, and further, the combination of Calder,

Lomet and Razdow does not explicitly teach providing for execution of the code

segments using threads; receiving a thread selection specifying at least one of the threads;

and displaying nodes executed by the at least one thread. Cai teaches providing for

execution of the code segments using threads; receiving a thread selection specifying at

least one of the threads; and displaying nodes executed by the at least one thread (column

7, lines 30-40).

It would have been obvious to one having ordinary skill in the computer art at the time of the invention was made to modify the method disclosed by the combination of Calder, Lomet and Razdow to include the step of providing for execution of the code segments using threads; receiving a thread selection specifying at least one of the threads; and displaying nodes executed by the at least one thread using the teaching of Cai. The modification would be obvious because one of ordinary skill in the art would be motivated to provide improved memory performances (Cai, column 1, lines 61-67 to column 2, lines 1-2).

Per Claim 16:

This is a computer-readable medium version of the claimed method discussed above, claim 5, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Per Claim 26:

This is a computer readable memory device version of the claimed method discussed above, claim 5, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth above. Thus, accordingly, this claim is also obvious.

Response to Arguments

12.   Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

In the remarks, the applicant argues that:

a)   Applicants' claimed invention in which graph nodes are assigned to blocks of

memory, Calder's graph nodes merely corresponds to units of instructions – the units of

instructions do not correspond to blocks of memory.

Examiner's response:

a)   Examiner strongly disagrees with applicant's assertion that the units of

instructions do not correspond to blocks of memory. By definition, a block is a group of

instructions in a program that are treated as a unit. Therefore, the unit is stored in one

block of memory. In addition, see the rejection above in paragraph 10 for rejection to

claim 2.

Conclusion

13.   Any inquiry concerning this communication from the examiner should be directed

to Qamrun Nahar whose telephone number is (571) 272-3730. The examiner can

normally be reached on Mondays through Fridays from 9:30 AM to 6:00 PM.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wei Y Zhen, can be reached on (571) 272-3708. The fax phone number for

the organization where this application or processing is assigned is (571) 273-8300.

        Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the TC 2100 Group receptionist whose telephone

number is 571-272-2100.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

QN
April 24, 2006

WEI ZHEN
SUPERVISORY PATENT EXAMINER